PHENIX HBD Heater Operating Procedure

procedure name

PHENIX Procedure No. PP-2.5.5.6-05

Revision: A **Date: 10-17-2006**

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approvals

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PHENIX Electrical Engineer

Date 10-23-2006

David Morrison, P.E.
PHENIX Mechanical Engineer

Date 10/23/2006

PHENIX
PHENIX BEAMPIPE PROTECTION

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PHENIX Electrical engineer

Date _____

PHENIX Mechanical engineer

Date _____

REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	AUTHOR	APPROVED BY	CURRENT OVERSIGHT
A	Original Issue.	10/17/2006	P. Giannotti	P.Giannotti, D. Lynch	P. Giannotti

System Description: The HBD Heater System provides electric heating to both halves (east hemisphere and west hemisphere) of the HBD detector. The main heater controls are housed in a 24" wide x 30" high x 8" deep metal enclosure located on the Central Magnet Bridge. The front panel controls and indicators are separated down the middle. On the left hand side are the HBD east hemisphere heater controls. The right side - west hemisphere heater controls - are identical to the east side.
Immediately below this box is another smaller enclosure that contains the temperature sensor termination blocks (thermocouples & RTDs) and the ADAM Data Acquisition System input/output modules.
Single phase 120 volt AC power is connected to the system from the PHENIX Counting House Utility Power Panel UP-1. Circuit # 26 powers the east heaters, circuit #28 powers the west heaters, and circuit #30 powers the ADAM I/O modules.
Each HBD hemisphere is fitted with 6 Kapton heater panels, 18 thermocouples and 2 platinum RTDs. The heaters can be remotely controlled and temperatures monitored from a graphic display on the PHENIX Control Room RMC PC.
At the heart of each HBD hemisphere's controls is a Minco CT-16A temperature controller. The controller reads a single RTD and powers the parallel connected heaters via a solid state relay. The system is designed to automatically shut off the heaters upon sensing heater overtemperature, overcurrent or if the RTD signal is disconnected. If any single heater panel is sensed to be off, an alarm will be reported on the annunciator alarm panel in the PHENIX Control Room.

1. Prerequisites

- Only system specialists will implement this procedure (P.Giannotti, F.Toldo) as approved by PHENIX Engineering.
- The ADAM Data Acquisition System shall be operational.
- The PHENIX Control Room Annunciator Alarm System shall be operational.

2. Procedure

2.1 **Initial system startup and alignment.**

Note: The east and west heater controls are identical. Therefore, only the EAST HBD heater system control procedure will be described below. If the startup and alignment steps have previously been performed, then, proceed to step 2.2.1.

2.1.1 Verify that the HBD East panel controls and indicators are powered on. Verify a temperature is being displayed on the temperature controller.

2.1.2 Verify that the RMC computer – HBD HEATER display is indicating status and temperatures in the PHENIX Control Room.

2.1.3 At the HBD Heater Control Panel, temporarily remove the Variac shaft locking bar. Adjust Variac output voltage to 35 volts AC as read from the front panel voltmeter. Re-install the locking bar.

2.1.4 Program the Minco temperature controller with the correct parameters for RTD input, Self Tune Function, degrees C units and output alarm settings. Set the process temp. value for 40 degrees C and high temp. alarm for 42 degrees C.

2.1.5 After all settings have been confirmed, enter the password value to disable the front pushbuttons on the controller thereby preventing setpoint changes by unauthorized persons.

2.1.6 Turn on the HBD East Heaters from the local control panel or remotely via the RMC PC in the PHENIX Control Room.

2.1.7 Monitor all heater, surface area, and preamp temperatures. Verify that no single temperature exceeds 40 degrees C.

2.1.8 Adjust each heater's current sensing switch threshold setting to be ON. Verify that the Heater trouble/fault alarm is clear when all heaters are drawing their operating current.

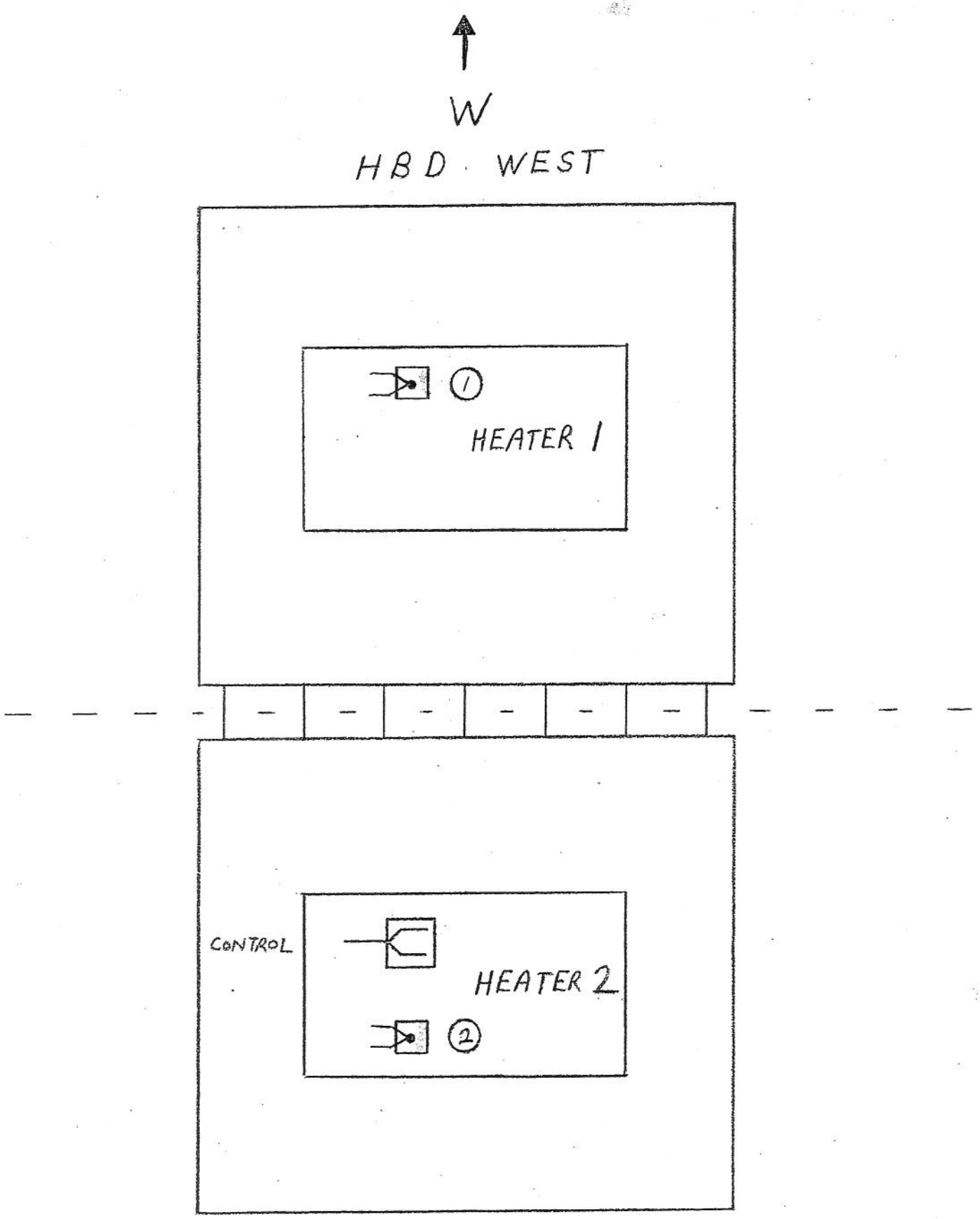
2.1.9 View the total heater circuit operating current on the blue digital readout located inside the main control panel. Set the overcurrent trip setpoint to be 1 amp over the displayed value. For example: If the displayed current is 12 amps, then, set the trip point for 13 amps.

2.2 Normal Operating Procedure

Note: The HBD heaters require minimal operator attention as the system includes redundant fail safe interlocks. If the heaters are to be continuously energized, it's recommended that PHENIX Watch shifts be active in order to monitor temperatures and acknowledge alarms.

2.2.1 Turn on the HBD Heaters from the local control panel or remotely, from the PHENIX Control Room RMC PC.

2.2.2 Monitor all temperatures periodically.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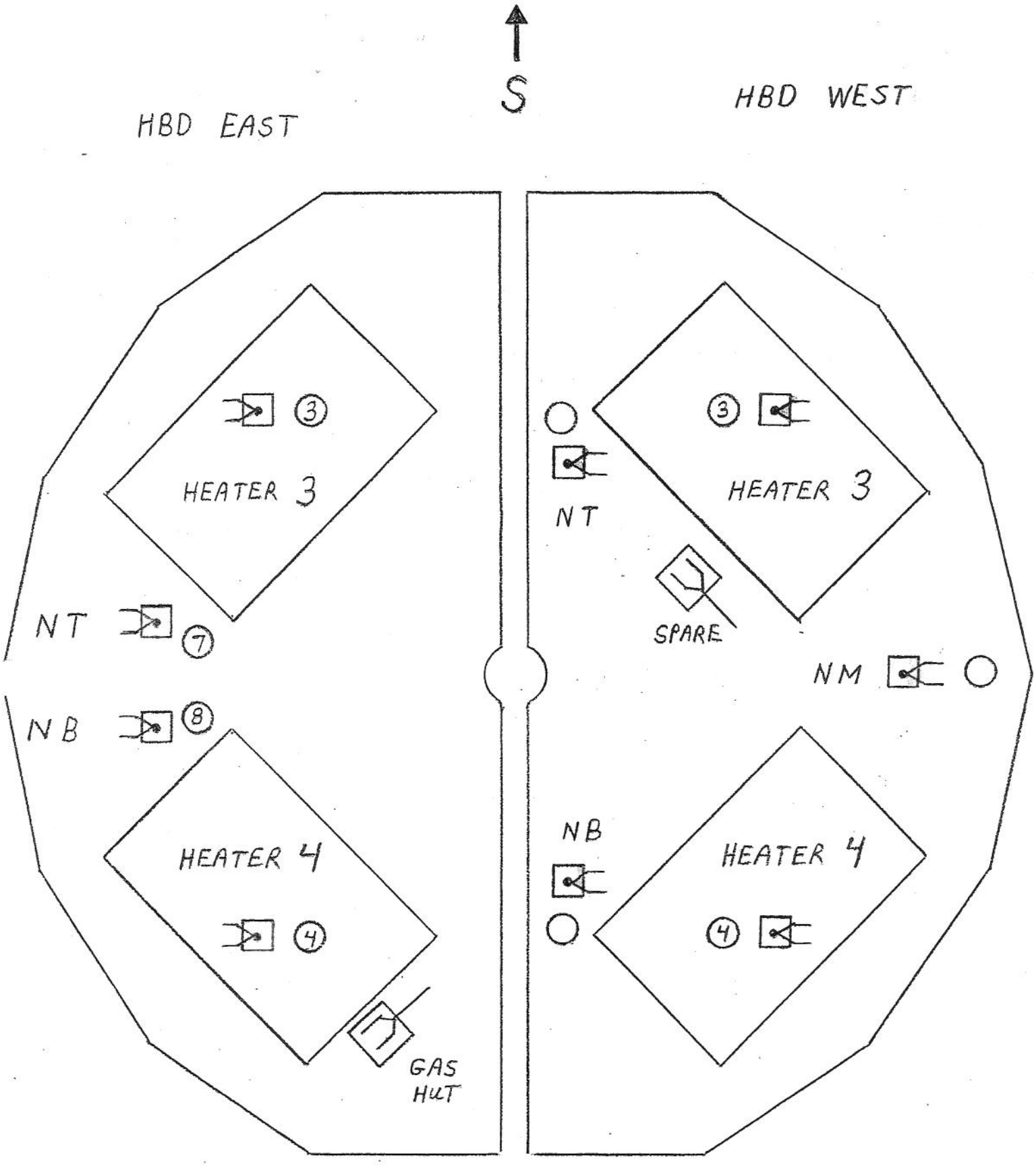
HEATER 1
CONTROL
HEATER 2
2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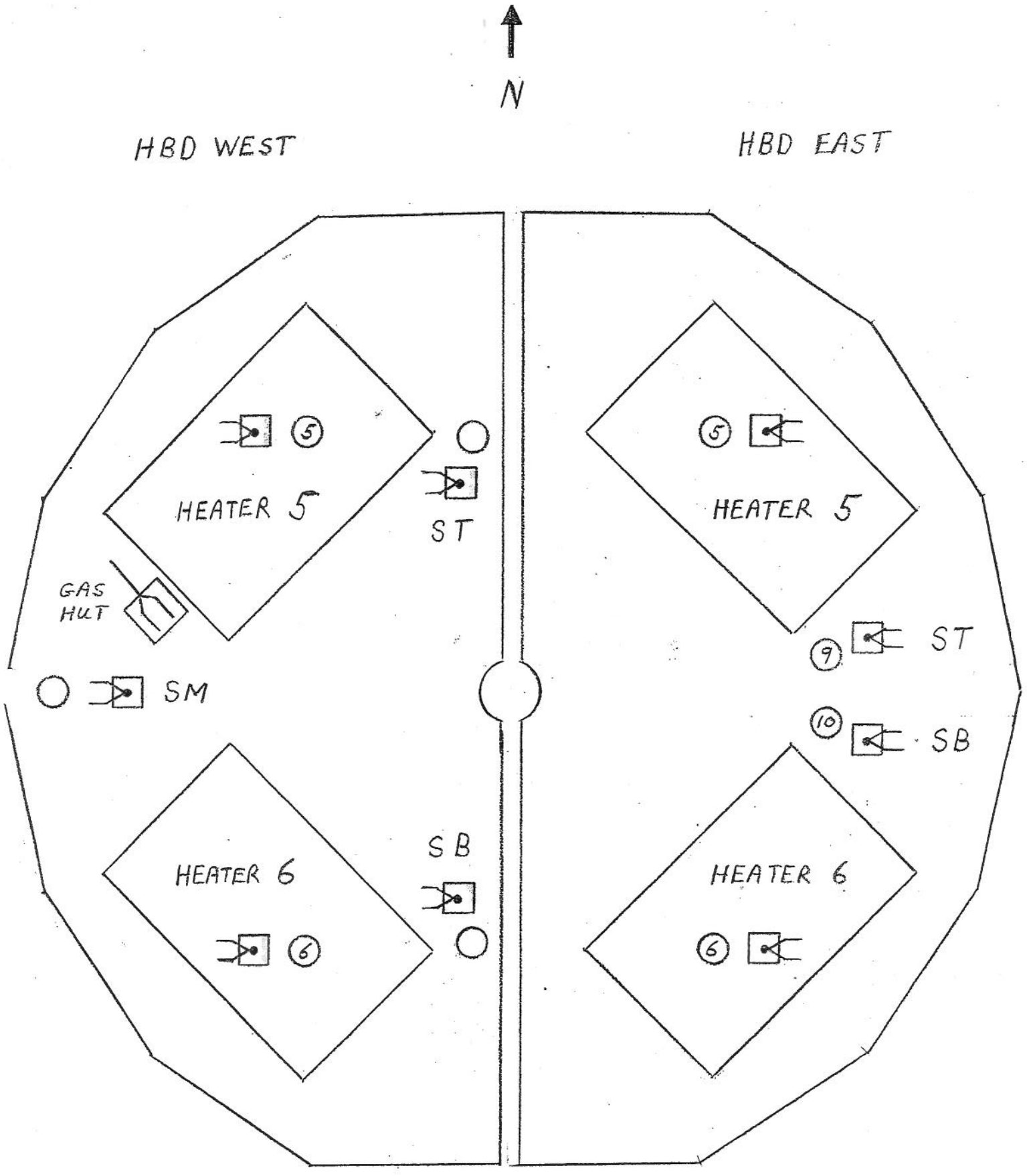
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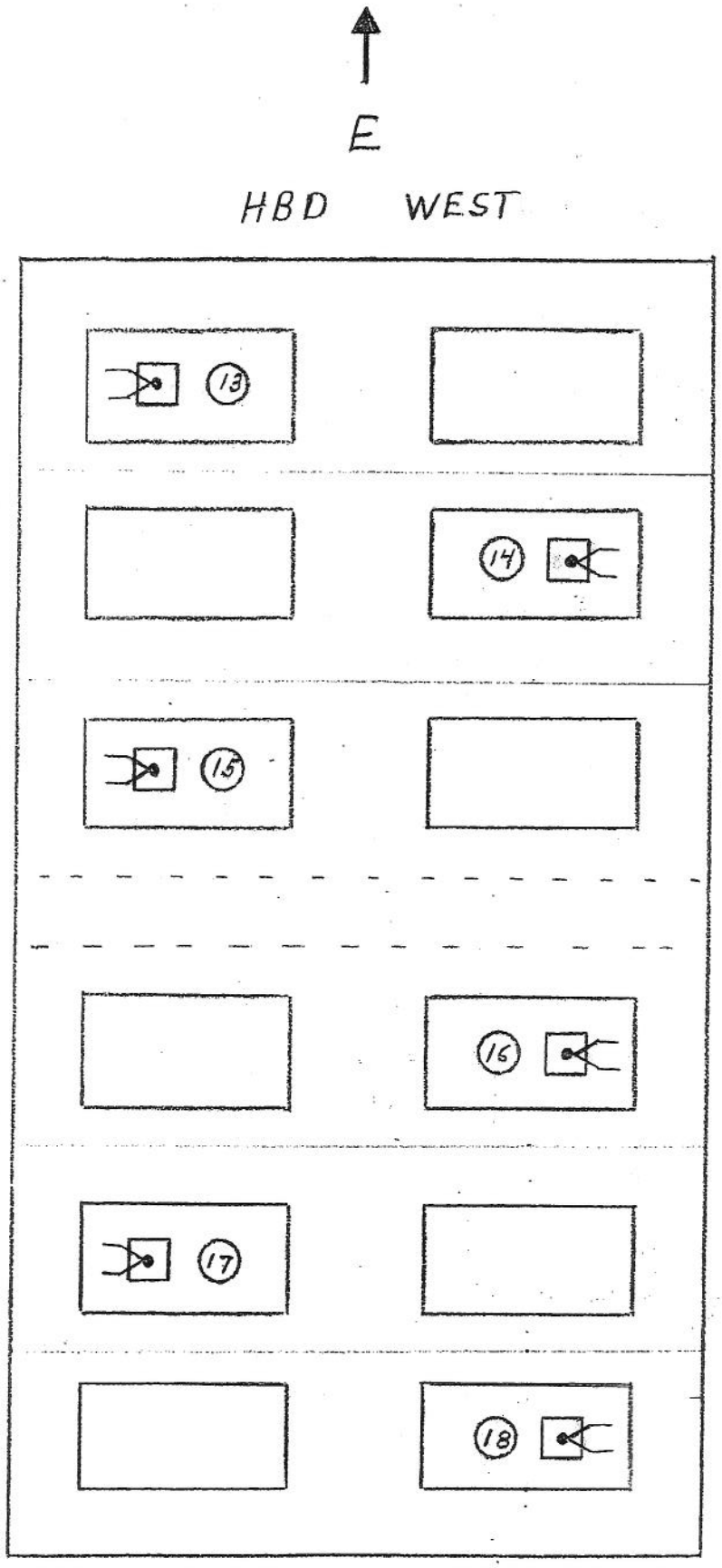
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PREAMP BOARDS